Iowa Science Teachers Journal

Volume 11 | Number 3 Article 3

1974

To Dye or Not to Dye

A. C. Haman
University of Northern Iowa

TO DYE OR NOT TO DYE

A. C. Haman
Associate Professor of Biology
University of Northern Iowa
Cedar Falls, Iowa

In the beginning there was water and rock, but as plant life evolved, the globe became more colorful. Cool greens gradually enveloped the earth as successive waves of mosses, ferns, conifers and angiosperms conquered the land. In addition new pigments evolved providing artistic man with new mood-creating dyes with which to color his existence.

Primitive man utilized dyes to color his skin to frighten his enemies and increase his prestige. Greek ladies, dissatisfied with the color of their hair, used buckthorn, *Rhamnus*, to stain their hair yellow and add to their charms. European aristocrats of the Middle Ages, traveling incognito, camouflaged their faces with walnut stains. As a result of searching for new plants or cultivating them in fields, man learned their properties and habits and became proficient in extracting those pigments he desired to stimulate his senses.

In the past, nearly all the commercial dyes were of plant origin, but today the natural dyes are used only to a limited extent and are difficult to obtain commercially. However, natural dyes are readily obtained from plant materials gathered in gardens, woods and along roadsides. Unlike synthetic dyes, natural dyes are difficult to standardize and they produce offbeat, one-of-a-kind colors, which are of contemporary interest to artistic craftsmen.

Due to lack of money and long distances to cities, rural inhabitants of colonial America explored their immediate surroundings for native dyes to color their homespun woolens. This process halted in 1856 when Sir William Henry Perkins discovered a cheap lavender dye made from aniline, a coal tar product. This discovery marked the beginning of the end for natural dyestuffs.

During World War I, when supplies of aniline dyes were cut off from Europe, there was a temporary upsurge of natural dyes and the countryside was once again scoured for pigment-bearing herbs. Currently synthetics are widely used again and this will undoubtedly continue until the supply of coal tar is exhausted.

Table 1 contains a partial listing of plants that are found in Iowa

used in the past for staining purposes. References at the end of this article tell how to extract and use the dyes in staining. Should our synthetic sources fail, these plants would not keep us from dyeing.

TABLE 1

SOME USEFUL DYE PLANTS FOUND IN IOWA

Family	*Scientific Name*	*Common Name*	*Color*
Aceraceae	*Acer platanoides*	Norway maple	tan
Anarcadiaceae	*Rhus* sp.	Sumac	tan
Berberidaceae	*Berberis vulgaris*	Barberry	yellow
Betulaceae	*Betula pendula*	Silver birch	yellow-purple
Caprifoliceae	*Sambucus nigra* or *canadensis*	Elderberry	yellow-violet
Compositae	*Dahlia* sp.	Dahlia	gold-yellow
	Rudbeckia triloba	Coneflower	yellow
	Solidago sp.	Goldenrod	yellow
	Tagetes sp.	Marigold	yellow
	Tanacetum vulgare	Tanzy	yellow
Equisitaceae	*Equisetum* sp.	Scouring rush	green
Fagaceae	*Quercus velutina*	Black oak	orange
	Quercus borealis	Red oak	yellow
	Quercus alba	White oak	brown
Hypericaceae	*Hypericum* sp.	St. John's wort	yellow
Iridaceae	*Iris pseudacris*	Iris	black
Juglandaceae	*Juglans nigra*	Black walnut	brown
Liliaceae	*Allium cepa*	Onion	yellow
	Convallaria majoralis	Lily-of-the-valley	yellow
	Hemerocallis sp.	Day lily	yellow-green
Oleaceae	*Ligustrum vulgare*	Privet	yellow-purple
Papaveraceae	*Sanguinaria canadensis*	Blood root	red
Polypodiaceae	*Pteridium aquilinum*	Bracken fern	green
Rosaceae	*Prunus* sp.	Cherry	chocolate brown
	Rubus sp.	Raspberry	rose
Rhamnaceae	*Rhamnus cathartica*	Buckthorn	yellow
Rubiaceae	*Galium boreale*	Bedstraw	yellow-red
Salicaceae	*Salix nigra*	Black willow	brown
	Populus nigra	Poplar	yellow-green
Saxifragaceae	*Ribes nigrum*	Gooseberry	purple
Vitaceae	*Vitis* sp.	Grape	lavender to purple

References
Androsko, R. J. 1971. *Natural Dyes and Home Dyeing.* Dover. 154 pp.
Robertson, S. 1973. *Dye from Plants.* Van Nostrand, Rheinhold. 144 pp.

EASTERN IOWA SCIENCE FAIR

This year's Eastern Iowa Science Fair was held April 6 and 7 at Washington High School in Cedar Rapids. Seventy-seven students participated with 58 exhibitors in the Junior (grades 7-9) Biological and Physical Division. Thirteen students exhibited in the Senior Biological while only six students exhibited in the Senior Physical Division.

Susan Yohn, a senior from Muscatine, won top honors in the Senior Biological Division with her exhibit "Splenic Injections and Their Effects on the Transplantation of Skin on Mice." Tom Nelson, a junior from City High School in Iowa City, took top honors in the Senior Physical Division with his project "Comparison of Early Electronics and the Electronics of Today." The Eastern Iowa Science Fair sent both students and Mr. R. L. Cassini of Muscatine (Tom's science instructor was unable to attend) to the 25th International Science and Engineering Fair at Notre Dame, Indiana, held May 5-11. Both Tom and Susan were winners at the International Fair; Susan later made a two week trip to England from recognition received on her project.

Three hundred seventy-nine finalists from 45 states, the District of Columbia, Puerto Rico and five foreign countries (Canada, India, Japan, Philippines, Sweden) participated in the International Fair. Two hundred seven exhibitors won a total of 424 awards. It is of interest to note that of a total of 379 finalists, there were 469 judges (212 ISEF Judges and 257 Special Award Judges). Future International Science and Engineering Fairs are to be held in Oklahoma City (1975), Denver (1976), Cleveland (1977), Anaheim (1978), and San Antonio (1979). Hope to see YOU there!